

A CONTRIBUTION TO THE ANATOMY OF THE INDIAN  
ELEPHANT. By R. J. ANDERSON, M.A., M.D., *Demonstrator of Anatomy, Queen's College, Belfast.*

THE very complete account of the anatomy of the Indian elephant, published in vols. xii. and xiii. of the *Journal of Anatomy and Physiology*, leaves little to be desired. An opportunity has been afforded me of examining a specimen of this animal, and in almost all points I have been able to verify the descriptions of Messrs. Miall and Greenwood.

In some points, however, my specimen differs from that of the above-mentioned anatomists. In a few others the description is supplemented. Where I do not note the difference, the descriptions are nearly alike.

The cutaneous muscle of the abdomen, wide above and narrow below, arises from the subcutaneous tissue above, and is inserted into the fascia of the thigh below. The fibres are parallel to those of the rectus, and overlie the pectoralis major and rectus.

The trapezius in this specimen differs from that of the specimen of Miall and Greenwood in having an origin from the inner half of the superior curved line of the occipital bone, as well as from lig. nuchæ and dorsal spines. The upper fibres pass to a tendon at the anterior edge of the muscle, which is inserted near the upper end of the spine. The posterior fibres are collected to a tendon which is inserted into the posterior border near the upper part.

The masto-humeral muscle consists of three parts. The posterior part is not mentioned in Miall and Greenwood's description, and may be regarded as a separate muscle. The posterior part arises from the basilar part of the occipital bone, is 3 inches in width and flat, and is inserted into the anterior border of the spine below, and the fascia covering the deltoid. The second part arises from the basilar portion of the occipital bone, close to the preceding, and is inserted with the third portion into the humerus in front of the deltoid. The third portion is round, and takes origin from the mastoid process. A

tendinous inscription occurs in the second and third parts, near the shoulder.

The sterno-maxillaris consists of three pieces below and two above. The middle part arises from the sternum, the lateral from the first rib, and these form a single muscle at the middle of the neck, which divides above into two muscle bands that are inserted into the inferior maxilla. Miall and Greenwood give this muscle as arising from the first rib, but state that the condition of their specimen did not enable them to note the attachment accurately.

The sterno-mastoid arises from the sternum for 3 inches, and is inserted into the lower part of the zygoma. Miall and Greenwood give the origin from the first rib. Mr. Young, in vol. xiv. of this *Journal*, gives the attachment to the sternum.

The rectus capitis posticus major and minor correspond to Miall and Greenwood's description, but I find no trace of a lateral rectus.

As in Mr. Young's specimen, the pectoralis major has a very extensive origin, from the sternum and ext. oblique aponeurosis. The upper fourth is superficial, and, as in man, passes down in front of the lower. The insertion is internal to that of the masto-humeral and outside the biceps, and into the fascia of the arm.

A triangular muscle, described as pectoralis minor by Young, I find arising from the cartilage of first rib, and inserted into the fascia covering the supra-spinatus. But no muscle comparable to a pectoralis minor inserted into the upper end of the humerus is present.

The deltoid in my specimen has a more extensive origin than that of Miall and Greenwood. It arises from the posterior border of the spine, the unciform process, posterior border of scapula (origin, fleshy below, tendinous above), and the inter-muscular septa between it and the infra-spinatus and triceps.

The biceps has a single head of origin from the upper part of the glenoid process. It represents the gleno-radialis of Krause. The coraco-brachialis, representing the coraco-ulnaris of this anatomist, arises from the coracoid process and capsule, and is inserted in the inner border of the humerus in its whole length. (This agrees with Mr. Young's description.)

The pronator teres has a large triangular part, which underlies the long fibrous band, and has a fleshy attachment for 5 inches. (More extensive than in Miall and Greenwood's specimen.)

A radio-carpi, not described by the above-mentioned anatomists, arises from the surface of the radius external to the pronator teres extending to the lower extremity, and from the interosseous membrane. The fleshy part of the muscle is succeeded by a flat tendon that is inserted into the anterior ligament of the wrist joint. The origin of the muscle corresponds nearly to that of the flex. long. pollicis in man.

The tensor vaginæ femoris in this specimen has a more extensive insertion than that described by Miall and Greenwood. Arising from the anterior third of the iliac crest and fascia lata, it is inserted into the fascia lata above the middle of the thigh, half the circumference of which it surrounds. It is connected with the gluteus maximus and biceps behind.

The internal oblique of the abdomen arises from the anterior fourth of the iliac crest and the outer part of Poupart's ligament, the fascia, lumborum, and last rib but two, and the last but three by tendinous slips. The fibres radiate so as to form a fan-like muscle. It is inserted into the abdominal aponeurosis. A flat muscle band is inserted into the last rib behind.

The transversalis abdominis arises from two-thirds of the iliac crest, fifteen ribs, and the lumbar aponeurosis. The lower margin of the muscle forms an arch 10 inches in length above or in front of Poupart's ligament.

No sartorius is present.

The tibialis posticus arises from the posterior surface of the tibia below the popliteus, the fibula and septa, and is inserted into the 2nd, 3rd, and 4th metatarsal bones.

The following are the measurements of the viscera:—

The stomach is 1 metre 40 cm. long, 33 cm. in diameter.

The cardiac opening is 44 cm. to the right of large end.

Length of small intestines, 60 feet.

Length of large intestines, including cæcum and rectum, 26 feet.

Length of cæcum, 2 feet 2 inches.

Circumference of cæcum, 50 inches.

Circumference of colon: 1st part, 34 inches; 2nd part, 30 inches.

Rectum, 14 inches.

Small intestine, near stomach, 7 inches; near cæcum, 10 inches.

*The spleen* is attached to the stomach by the gastro-splenic omentum. Its weight is 3 lbs. 13 ounces. Length, 1 metre 24 cm.; breadth at widest part, 10 cm.

The liver has two lobes, weighs 30 lbs., is 69 cm. long, 39 cm. broad, and 7 cm. thick.

The pancreas weighs  $3\frac{1}{4}$  lbs.

The heart, 15 lbs. (a portion of the aorta is included).

The lungs, 32 lbs. 4 oz.

The brain,  $6\frac{1}{2}$  lbs.

The kidneys: The right—length,  $26\frac{1}{2}$  cm.; breadth,  $19\frac{1}{2}$  cm.; thickness,  $5\frac{1}{2}$  cm. The left—length, 29 cm.; breadth, 20 cm.; thickness, 6 cm. The weight of the right is  $3\frac{3}{4}$  lbs., and the left 4 lbs. Eight lobes are present in each.

The bladder measures 30 cm. from base to apex, and 24 cm. in diameter transverse.

The supra-renal capsules weigh 3 ounces each; each has a double cornu internally.

*The uterus* is 16 cm. in length, and is 6 cm. in circumference.

The Fallopian tubes, each 45 cm. in length.

The vagina, 30 cm. length, 18 cm. circumference.

The genito-urinary passage, 80 cm. length, 19 cm. circumference below, 30 cm. above.

The length of the clitoris is 45 cm.

The weight of the animal was  $1\frac{1}{2}$  tons (?).